conferred, has presented the Association with a gift of 10,000 francs. The Association has been able to distribute assistance to those engaged in scientific research to the extent of 7,000 francs during the past year; of this sum 5,000 francs was accorded to Dr. Janssen as a contribution to the expenses of his recent voyages, and 2,000 francs to M. Chapelas-Coulvier-Gravier, to enable him to continue his researches on shooting stars. M. Cornu referred to the great importance of the Puy-de-Dôme Observatory, of which we have frequently spoken, and the formal opening of which had been deferred in anticipation of the present meeting. He concluded by eloquently urging the Association to continue to be animated by the spirit in which it was begun in the days of France's sore distress, to keep free from all party spirit, and to seek to be spoken of only and always as the friend of science and of the country.

The treasurer, M. Masson, gave an account of the state of the funds, which is very satisfactory. The Association is prosperous, numbering 2,200 members, including 200 ladies. The receipts for the Nantes meeting were greater by 400*l.* than the expenses. The funds of the Association amount this year to 7,000*l.*

In the evening a reception was held at the Hôtel de Ville by the mayor, which was perfectly successful.

On Saturday, at two o'clock, the several sections met to appoint their officers. Among the strangers present were Lord Houghton, Dr. Gladstone, the Rev. S. J. Perry, Mr. Eaton, Prof. Boyd Dawkins, and several other Englishmen.

M. de Mortillet, the sub-director of St. Germains Museum, has been nominated the president of the section of Anthropology. He delivered an address on the origin of superstitions. He showed that the present superstitions must be mostly connected with old Celtic populations.—M. Tchebycheff, the Russian geometer, has been appointed president of the Section of Mathematics. M. Tchebycheff exhibited a machine for performing addition and subtraction with extraordinary rapidity.—M. de Lucas presented the designs for the construction of a machine intended for the fabrication of prime numbers.

The places of interest in and around Clermont are open to the inspection of the members of the Congress, as is the case at meetings of the British Association, consequently the Sunday excursions have been numerous and highly attractive. The prehistoric archæologists visited the palæolithic habitations recently discovered at Issoire. A pleasure trip was made to Vichy, and a large number of members went to Thiers. The excursionists to Vichy were welcomed by the Mayor, Dr. Cornil. Among the toasts proposed was that of Lord Houghton, as a Vice-President of the British Association, who made a suitable reply.

In the city of Clermont are located the celebrated incrusting fountains, which convert into stone, wood and even animals. A rich collection of specimens has been opened for inspection, and will be visited officially by the Section of Geology this week.

An incident has occurred which created a little sensation. The members were assembled in a general meeting to hear a lecture on the mountains of Auvergne, when an intimation was received that the lecturer had been taken ill. M. Claude Bernard, the well-known physiologist who was present, was therefore invited to deliver an address. He lectured on the sensibility of plants, a subject which he has been investigating.

SCIENCE IN GERMANY

(*From a German Correspondent*)

M. W. SIEMENS has recently endeavoured to determine the velocity of propagation of electricity in suspended wires. His method of observation consists in the employment of two insulated Leyden jars (or two charge tables), the outer coats of which are metallically connected together. The inner coating of one jar is directly connected by a short wire with a metallic point; that of the other is also connected with this point, but by a long circuit line. Opposite the point stands a rotating metallic cylinder connected with earth. When the outer coats of the jars are connected with earth, the electricity of the inner coating of both jars at that moment becomes free, and is discharged through the point and the rotating cylinder to earth. If the rotation is sufficiently rapid, and the line long enough, there are produced on the smoked cylinder two marks with an interval between them, which is the measure of the time the electricity took to pass through the wire line from the jar to the point. This arrangement was also modified by placing two points, instead of one, opposite the metallic cylinder; the one being connected directly with one jar, the other by the line with the other jar. A discharge of the jars was first obtained while the cylinder was at rest, and then the discharge was made with the rotating cylinder.

M. Siemens thought at first that the velocity of propagation of electricity must be proportional to the specific conductivity of the material. In discharge of a jar through a caoutchouc tube filled with water, or through a wet thread, no time difference could be perceived between the mark of the direct discharge, and that of the first partial discharge through the liquid. It was the same with discharge of the jar through a strong caoutchouc tube, 100 feet long, and 20 mm. clear diameter, which was filled with zinc vitriol solution. Now, since a difference of five millionths of a second might be distinctly perceived, it is thus proved that the velocity of electricity in liquids must be *over* 800 geographical miles per second. As the conductivity of copper is at least 200 million times greater than that of the zinc vitriol solution, the velocity of electricity in copper must be at least 160,000 geographical miles if the specific conductivity were synonymous with the velocity of electricity.

From experiments with longer telegraph lines it appeared that the propagation of electricity in conductors occurs with a determinate velocity independent of the length of the conductor; this is, in iron wires, between 30,000 and 35,000 geographical miles per second. (The length of the line was in one case 25·36 kilometres, in others 23·37 and 7·35 kilometres.)

M. Siemens proposes to make similar experiments with a copper circuit in order to decide, by direct experiment, the question whether the velocity of electricity depends on the nature of the metallic conductor or not. From the experiments made with the caoutchouc tube filled with zinc vitriol solution, he considers the latter the more probable. We may further remark that Prof. Kirchhoff (in establishing Weber's fundamental law for the motion of electricity) already previously obtained the number, 21,000 miles, for the velocity of electricity in conductors, and at the same time came to the result, that this velocity must be equally great in all conductors. Siemens's measurements come much nearer to Kirchhoff's values than to that obtained by Wheatstone, viz., 61,900 geographical miles. S. W.

GERMAN EXPEDITION TO SIBERIA

AS a sketch of the present state of Central and Northern Asia, it may perhaps not be uninteresting to our readers to have laid before them the following extract from a letter written by Dr. Finsch, who, together with Dr. Brehm and Count Waldburg-Zeil, is at present engaged in the scientific exploration of Southern Siberia, under the auspices of the German Arctic Society. The letter dates from Lepsa, near the Balkash-lake, May 13.

"We started for Lepsa on May 3, and camped the first night in 'yurts'—tents—ready for us at the foot of the Arkat Mountains. The yurt destined for our own use was splendidly decorated [for, thanks to the orders of the Czar, the travellers found at each station everything requisite for their comfort and the prosecution of their journey ready for them; in addition they were always accompanied by a picket of Cossacks, who had to provide horses for them, and to see them safely from station to station.]

"Many Kirghiz chiefs, dressed in their picturesque attire, were awaiting our arrival, and we found a repast of pillaf, lamb, and kumis, ready for us. The Arkat Mountains are a mass of

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bare, grotesque-looking rocks of granite, about 1,000 feet high. It is a solemn sight to see them gradually rise before your eyes out of the vast treeless steppe. Numbers of Argali were seen running on the mountains, and we proposed for the next day an Argali-hunt. The hunting party offered a strange picture on the next morning; there were fifty Kirghiz chiefs on horseback, many of them holding golden eagles on their hands. These birds are trained here to catch the wolf and the fox, and they acquit themselves excellently of their task, except in spring, when, their minds being taken up by love-thoughts, they are unfit for work. It is wonderful to see how the Argali dash along the rocks, and the young ones as quick, or perhaps still quicker, than the others. Several Argali and Argali kids were killed; we saw also a wolf, but failed to kill him. On the next day was a race of the Kirghiz boys; they rode 20 versts in 54 minutes. After that there was a wrestling match. The Kirghiz formed two divisions, each having its champion, who, dressed in shirt and drawers, was ready for the match. They stood with their shoulders together, and tried to throw each other down by seizing each other's girdle. The combatants were fine, muscular fellows. They showed also some equestrian feats, such as riding at full gallop standing. At about seven o'clock we continued our journey, and arrived the next morning in Sergiopol, formerly called Ajacus, a small town of about 1,000 inhabitants. The road to Sergiopol leads altogether through the steppe, which from time to time is covered with small mountain-ranges; on the last station before Sergiopol we saw for the first time the snowy tops of the Targabatai.

"Interspersed everywhere through the steppe are the yurts and peculiar tombs of the Kirghiz, whose herds wandering over the steppe help to animate it. The town lies in a treeless plain; before reaching it we were received by a picket of Cossacks in their gala-uniform, who conducted us to our quarters. Here we were welcomed by the district chief, Col. Friedrichs, who for ten days had awaited us in Sergiopol. Here we obtained some fine specimens of fishes from the Balkhash-lake, and we continued our road accompanied by Mr. Paul, a German telegraph official, and the commander of the town, Major Politzky. The line of Cossacks is here at an end. From time to time there is a miserable mud hut called "picket," where Cossacks ought to be. Horses are generally to be had there, vehicles but seldom. Our road led us always through the steppe, which began to show a white salty incrustation, and which everywhere is bordered in the most picturesque manner by the Tarbagatai. All along the road we were accompanied by Cossacks and chiefs of the Kirghiz. We took our first station on the banks of the Karakol, where we had a splendid view of the Tarbagatai and the more distant snowy heights of the Ala Tau, in the south. Here we found new specimens of the fauna of the steppe; the sandpiper, the eastern turtledove (*Turtur gelastes*), the white-throated lark of the Alps, the grey-headed wagtail. During the night we heard a strange cry, and found it to proceed from a frog, of which we obtained a specimen. Beetles were very scarce in the steppe, nor did we see any butterflies; perhaps it was still too cold. Our tea gets worse and worse, as now the water contains more and more salt; our principal beverage is, therefore, kumis, which, after all, is not so bad; it tastes a little sour, like buttermilk, and has a strange smell and after-taste. The major and Mr. Paul remained behind in Karakol, and so did our baggage-cart, therefore our baggage had now to be carried by three camels. Behind Karakol are the first Kirghiz who cultivate the soil; they grow wheat in vast fields, irrigating them by damming the river, and turning over the fertile soil with a miserable plough that penetrates only to a depth of a few inches. The labourers were surrounded by numbers of *Larus ridibundus*. The first 12-15 versts we had to ride, because, from this forward, only the wild horses of the steppe were to be had, which up to this time had never seen a vehicle. It was most interesting to see the wild animals harnessed to the tarantassa; five fellows had at times enough to do to hold a single horse, and then off we went with shouts and blows, away like the wild huntsman in the story-book. As long as the vehicle held together everything went on well, but very often traces and reins broke at the first start. The steppe is covered with rhubarb, hemlock, and spiræa just beginning to flower. Where the alkali earth begins the ground was bare, and the plants which grew there had a grey, sombre colour. We saw sometimes the great and little bustard, also many kites, and here and there a golden eagle—kulans (wild horses) and antelopes (saigas) were not seen. On May 8 we entered upon the genuine salt steppe, and our horses sank up to their fetlocks in soil covered with a crust of white salt. The dust was awful; our way led through immense beds of reeds, and we found ourselves most probably in the dry bed of the lake Ala Kul. At night we reached the banks of the actual lake from the west side. At first there is nothing but a dense mass of reeds, only here and there is a narrow strait visible. Many geese, ducks, and swans were heard; we obtained here a specimen of the land tortoise. The next day we continued our road on the south side. It was very hot, and splendid mirages were dancing in the air; our way led continually through the salt steppe; the lake was mostly covered by reeds; only at two places was it to be seen. In the afternoon we reached a camp of yurts situated at the foot of a hill on the south side of the lake. The scenery before us was splendid; in the foreground the vast surface of the lake of a greyish blue bordered in the background by the Tarbagatai, and behind it rose the snowy summits of the Ala Tau. Numbers of birds are at the lake, innumerable grey geese with their young ones, ducks, swans, grey cranes, gulls, amongst these the beautiful grey fisher-gull (*Larus ichthyætus*). The waterfowl were unfortunately very shy and scarcely to be approached. Near the lake on the steppe we found for the first time rose-starlings (*Rosenstaare*) and black-headed wagtails, amongst these some with white eye stripes, and a peculiar lark. We did not obtain any specimen of the reed-pipers, because shooting was impossible among the dense reeds. I got all the Kirghiz to help me to collect, and so we obtained beetles and two varieties of lizard, one most interesting, a kind of gecko, with pink and blue spots. It was very hot, 79° F. in the shade, and many gnats appeared. After having made a small raft out of the trunks of trees we went fishing and caught many fishes, but only three to four varieties, all unknown to me, most interesting, and by no means belonging to the European kinds, with the exception of a sort of Cobitis. There was a peculiar fish about 2 feet long called Marinka, and said to be poisonous, but we tasted it and found it quite palatable. For two days we remained near the lake, living in a yurt belonging to the Sultan Abin Dair, who traces his pedigree from Jenghis Khan, and belongs to the "nobility of the white bone"; he possesses 2,000 yurts in his dominions. We collected many plants and some snails near the Ala Kul, and took samples of the soil, salt and water. We continued our road, passing through the steppe, onward to the Ala Tau, at the foot of which we took a night's rest in a yurt, whence we saw many Kirghisian tombs of unburnt bricks. The next day we were obliged to ride, because one of the horses objected altogether to be harnessed, and the others ran away with the vehicle. After some time, however, they became quieter, and we could again get into the vehicle. Meanwhile, the temperature had changed; it was very chilly; we were cold in spite of the furs, and happy to reach another yurt camp at about midnight. The road was scarcely perceptible; the Cossacks had to hold the carriage with ropes, and we heard continually the cry of "derschdi," *i.e.* hold fast. Dr. Brehm had an upset. On the next morning our road led through the green steppe interspersed with many "Auls" of the Kirghiz, whose herds, consisting chiefly of goats and fat-tailed sheep, were pasturing here and there. In the south the steppe was bordered by green hillocks, with masses of red outcropping rocks; in the west by bare sand hills, in the north and east by a higher range of mountains, covered with fresh-fallen snow, behind which rose the high summits of the Ala Tau. And on we went more into the mountains. We passed over the river Dschindschilla, where red bole is to be found, and then on without interruption through ravines and over mountains, on through the green but treeless landscape. We collected magnificent wild, red peonies, blue campanulas, and other plants; and here we saw for the first time the bee-eater. At length we saw Lepsa before us in the plain, surrounded by green but bare mountains; except in the south where they were covered with trees, behind which rose the picturesque peaks and cones of the Ala Tau, half their height covered with snow. Lepsa has nearly 3,000 inhabitants, consisting mostly of Cossacks and Tartars. Some Kirghiz live near. Broad streets planted with birch trees run through the town and give it a pleasant appearance. The houses are nearly all small and built of wood. Besides the Cossacks there is a regular battery stationed there. The town was founded since the conquest of Turkestan, and is growing rapidly. The Cossacks cultivate the ground and keep bees; the honey is very fine, and cuts like lard. We live very comfortably in the house of a rich Cossack, who possesses 2,000 hives, and only regret that we have to leave so soon."

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